
Space Weather Forecast

Issued on Thursday, 15 June 2023 at 13:15 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales <https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales>

Space Weather Forecast Headline: Chance of Moderate solar activity with R1/R2 Radio Blackouts. Chance of G1/Minor geomagnetic storm conditions 15 Jun.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Low with only Common-class flares observed, the largest from a decayed sunspot region in the southwest. Three moderately complex sunspot regions in the southeast of the disc make up the bulk of the flare potential at present. The remaining regions on the disc are small and relatively simple regions. A small filament, which is an arc of material held together by the Sun's magnetic field, erupted from the SW-disc around 14/1800 UTC although no Earth-directed Coronal Mass Ejections (CMEs) have been observed. There are also a number of other large filaments on the Earth-facing disc, with the potential to produce Earth-directed CMEs if they were to erupt.

Solar Wind / Geomagnetic Activity: The solar wind was largely indicative of a background slow wind regime, however solar parameters increasingly now suggest the beginning of the onset of a high-speed stream associated with a large equatorial coronal hole. Solar winds have been at background levels throughout, mainly around 350km/s but an increase to between 370-400km/s has taken place in recent hours. The total magnetic field strength was largely Weak, but increased to Moderate levels from around 15/0800 UTC. The important north-south component varied only weakly between positive (north) and negative (south) directions. Geomagnetic activity was Quiet throughout.

Energetic Particles / Solar Radiation: The count rate of energetic particles (High energy protons) remained at background with no solar radiation storms occurring.

Four-Day Space Weather Forecast Summary

Solar Activity: Low activity is most likely to continue, however there is a chance of this increasing to Moderate with isolated M-flares (R1/R2 Radio Blackouts).

Solar Wind / Geomagnetic Activity: There are no Earth-directed CMEs. Solar winds are forecast to increase on day 1 (15 Jun) from background to elevated or perhaps strong levels by early day 2 (16 Jun), this resulting from the fast wind enhancement from a large, equatorial coronal hole. Peak winds of around 550-600km/s are forecast. Winds gradually declining into days 3 and 4 (17 and 18 Jun) to slightly elevated or background levels. Geomagnetic activity is forecast to be Quiet initially, but probably rising on day 1 (15 Jun) to become Unsettled with Active spells with the fast wind enhancement. There is a chance of isolated G1/Minor Storm intervals, mainly later on day 1 (15 Jun), but with a slight chance early on day 2 (16 Jun). Activity then easing to Quiet with Unsettled intervals day 3 and 4 (17-18 Jun).

Energetic Particles / Solar Radiation: The count rate of energetic particles (High energy protons) is forecast to persist at background with no solar radiation storms occurring.

Geomagnetic Storms:

Geo-Magnetic Storm	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Minor or Moderate	G1 to G2	No	30	15	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability			(%)	(%)	(%)	(%)
Active	R1-R2 M Class	No	30	30	30	30
Very Active	R3 to R5 X	No	2	2	2	2

Solar Radiation Storms - (High Energy Protons):

Radiation Storms	Level (cm ⁻² sr ⁻¹ s ⁻¹)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Active	≥ S1	No	3	3	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = cm⁻²sr⁻¹s⁻¹)